

**Notice of RCRA Class 1 Permit Modification
in Accordance with 20.4.1.900 NMAC
(incorporating 40 CFR Part 270)**

**Waste Isolation Pilot Plant
Carlsbad, New Mexico**

June 21, 2000

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Consistent with the requirements of 20.4.1.900 New Mexico Administrative Code (NMAC) (incorporating 40 CFR §270) the U.S. Department of Energy, Carlsbad Area Office is submitting to the New Mexico Environment Department (NMED) this Notice of Class 1 Permit Modifications to the Hazardous Waste Facility Permit (#NM4890139088-TSDF) for the Waste Isolation Pilot Plant (WIPP). Specifically, this information is provided to comply with the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.42(a)(I)).

One modification is included in this submittal. It is submitted as a change under item B.1.a as identified in Appendix I to 20.4.1.900 NMAC (incorporating 40 CFR 270.42). Specifically, this change applies NMED permit requirements to sampling and analysis techniques which are adaptations of those in the permit.

The identified change does not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment and the modified permit is no less stringent than the current permit.

Class 1 Permit Modification

On-line Integrated Headspace Gas Sampling and Analysis

Description:

Remove the Fourier Transform Infra-Red (FTIR) method-specific language from the headspace gas on-line integrated sampling/analysis system description.

Basis:

The on-line integrated sampling and analysis systems described in the Permit is a single sample on-line system based on the FTIR method, which describes how a single sample is collected from the headspace of a container and delivered directly to the analytical (FTIR) instrument. The Permit further defines the requirement for an on-line batch as the samples collected and analyzed in a 12-hour period, which is also based on a single sample on-line integrated FTIR system. These requirements are necessary to assure the quality of data that are sampled and analyzed by a single sample on-line integrated FTIR system. However, other types of on-line sampling and analysis systems are possible using the sampling equipment in the permit and in the associated EPA guidance which use, instead of FTIR methods, the more conventional gas chromatography (GC) methods. The FTIR-specific requirements are not appropriate for a GC-based single or any multi-sample on-line integrated headspace gas sampling and analysis system. Instead, the GC-specific requirements are the most appropriate to apply to assure data quality.

The Permit currently allows several techniques for analyzing headspace gas; however, the on-line integrated sampling description in the Permit is specific to the FTIR on-line integrated method. In order to provide specific requirements for all types of on-line integrated systems using other analytical techniques and multi-sample configurations, the language of the Permit is being modified. This modification implements an equivalent performance-based approach using existing Permit requirements to establish requirements for other on-line integrated system configurations to ensure that the data generated by these systems meets the data quality objectives of the permit. As such, this modification is an administrative change that expands the utility of on-line integrated headspace gas sampling/analysis system while resulting in more stringent Permit requirements by defining how all on-line integrated sampling and analysis systems must operate.

Discussion:

The Permit requirements for on-line integrated headspace gas sampling and analysis systems incorporate specific requirements taken directly from the single sample on-line integrated FTIR method. All of these requirements are not applicable to other analytical instruments that may be used for on-line integrated systems and are not applicable to multi-sample on-line integrated systems.

A multi-sample on-line integrated system is a canister-based sampling system that is used to collect headspace gas samples from up to 20 containers, place them in

individual canisters that are permanently mounted to a manifold in an integrated holding area. The system then sequentially direct them to the analytical system. The system is considered to be on-line because the canisters are not physically removed from the manifold prior to the sample being directed to the analysis system. The multi-sample system typically integrates fixed canisters that are similar to SUMMA or equivalent canisters as part of the sampling system to temporarily hold samples prior to delivery to the analytical system. As with the single on-line integrated sampling system described in the Permit, the multi-sample on-line system utilizes the sampling manifold described in Section B1-1a(1) to collect the samples, direct them to the integrated holding area, and then deliver them to the analytical system. This system must meet all of the required equipment cleaning and leak check requirements for the type of equipment used as specified in the Permit. For example, the integrated holding areas must meet the cleaning and leak check requirements for SUMMA or equivalent canisters already specified in the Permit. Therefore, a multi-sample on-line integrated system is a combination of the existing approved techniques and is subject to all of the QA/QC and other operational requirements already specified in the Permit.

All on-line integrated systems must incorporate an analytical method that is currently allowable under the existing Permit and must meet all of the required QA/QC samples for the on-line integrated sampling system and the type of analytical system used (e.g., GC/MS, FTIR). The number and type of on-line QA/QC samples that are currently defined in the Permit for on-line systems are applicable to all analytical systems and multi-sample on-line integrated systems. This results in a system that is functionally equivalent and provides data comparable to the systems specifically called out in the Permit.

With the limitation that all on-line integrated systems must follow the existing requirements in the permit regarding the sampling and analytical system components, associated QA/QC samples, equipment cleaning and leak checks, there are only two differences between the general requirements for on-line integrated systems and the on-line integrated system requirements specified in the Permit. Both of these differences are due to the Permit having incorporated specifics from the single sample on-line integrated FTIR system method.

Section B1-1a of the Permit requires that an on-line integrated sampling/analysis system deliver the sample to the analytical instrument rather than having samples collected in containers that are similar to SUMMA or equivalent canisters. This statement applies to single sample on-line integrated systems using any allowable analytical technique and does not reflect operations for a multi-sample on-line integrated sampling/analysis system. In cases where multiple samples are taken and temporarily held in an on-line integrated system, the samples are delivered to the integrated holding area, which must meet all of the requirements for equipment cleanliness and leak checks already specified in the Permit. After all of the samples are collected in this fashion, the samples are sequentially directed to the analytical system. This variation does not affect the quality of the data and is equivalent to using a SUMMA or equivalent canister to store samples prior to transporting them to an analytical laboratory. Therefore, the multi-sample on-line integrated system meets or exceeds the performance basis specified in the Permit for sample storage prior to analysis without the requirement that the system deliver the sample directly to the analytical system.

The other difference is the way that an on-line batch is defined. Section B1-1b specifies an on-line integrated system batch as the number of headspace-gas samples collected and analyzed within a 12-hour period using the same on-line integrated analysis system. This statement is for a single sample on-line integrated FTIR system that directly delivers the sample to the analytical instrument according to the FTIRS method, which specifies the 12-hour analysis batch period. This requirement is related to the FTIR analytical instrument requirement that performance testing of the FTIR instrument be done every 12-hours to ensure that reference spectrum for calculating the absorbance spectra reflects the current operational environment (i.e., accounts for source intensity and contamination of optical components in the system).

Based on the existing Permit requirements and the definition of a batch in SW-846, a batch of samples analyzed using GC-based analysis methods is not defined by a 12-hour period. For all other types of headspace gas sampling and analysis, the Permit specifies the requirements for the sampling batch and defers to the specific method being used regarding an analytical batch. Therefore, the Permit requirements for an on-line batch should be based on the number of samples collected in a 12-hour period and not based on the analysis time. All other performance checks that are specified in the permit based on time rather than a per batch basis (e.g., BFB tunes every 12 hours) must still be met.

This change is no less stringent for FTIR systems than what is currently implemented in the Permit, because the FTIR method specifies the 12-hour analysis time requirement for a FTIR batch. The change only clarifies that the sampling batch must meet the 12-hour requirement and that the batch requirements for the analytical method being used must be met.

The permit does not contain sample custody requirements for on-line systems because samples are not transported to another location between sampling and analysis. Because the integrated holding area is a fixed, physical part of multi-sample on-line integrated sampling/analysis system and is not used to transport samples to a different physical location, the sample custody requirements in the Permit do not apply to any on-line systems.

Revised Permit Text:

a. B-3 Characterization Methods

The characterization techniques used by generator/storage sites includes acceptable knowledge, which incorporates confirmation by headspace-gas sampling and analysis, radiography, and homogeneous waste sampling and analysis. All confirmation characterization activities are performed in accordance with the WAP. Table B-6 provides a summary of the characterization requirements for TRU mixed waste.

TRU mixed waste may be characterized in lots (Section B-1a) and/or batches. A sampling batch can be up to 20 samples (excluding field QC samples), all of which shall be collected within 14 days of the first sample in the batch. An analytical batch can be up to 20 samples (excluding laboratory QC samples), all of which shall be received by the laboratory within 14 days of the validated time of sample receipt of the first sample in the batch. For on-line integrated headspace-gas sampling/analytical systems, samples will be collected ~~and analyzed~~ within a 12-

hour period using the same on-line integrated sampling/analysis system. **The analytical requirements are specified by the analytical method being used in the on-line system (e.g., FTIR, GC/MS).** Refer to Attachment B3 for additional clarification regarding the expected contents of data reports and data packages specified in this Permit Attachment.

b. B1-1a Method Requirements

The Permittees shall require all headspace-gas sampling be performed in an appropriate radiation containment area on waste containers that are in compliance with the container equilibrium requirements (i.e. 72 hours at 18E C or higher). All waste containers designated as summary category S5000 (Debris waste) shall be sampled for headspace gas a minimum of 142 days after packaging and all waste containers designated as summary categories S3000 (Homogenous solids) and S4000 (Soil/gravel) shall be sampled a minimum of 225 days after packaging. This drum age criteria is to ensure that the drum contents have reached 90 percent of steady state concentration within each layer of confinement (Lockheed, 1995). The equilibrium time and drum age of all containers will be documented in headspace gas sampling documents. All waste containers with unvented rigid containers greater than 4 liters, except for Waste Material Type II.2 packaged in a metal container, shall be subject to innermost layer of containment sampling or shall be vented prior to initiating drum age and equilibrium criteria. The configuration of the containment area and remote-handling equipment at each sampling facility are expected to differ. Headspace-gas samples will be analyzed for the analytes listed in Table B3-2 of Permit Attachment B3.

The Permittees shall require site personnel to collect samples in SUMMA® or equivalent canisters using standard headspace-gas sampling methods that meet the general guidelines established by the U.S. Environmental Protection Agency (EPA) in the Compendium Method TO-14, Redetermination of Volatile Organic Compounds (VOC) in Ambient Air using Summa Passivated Canister Sampling and Gas Chromatography Analysis (EPA 1988) or by using on-line integrated sampling/analysis systems. Samples will be directed to an analytical instrument instead of being collected in SUMMA® or equivalent canisters if **a single-sample on-line integrated sampling/analysis system is used.** **If a multi-sample on-line integrated sampling/analysis system is used, samples will be directed to an integrated holding area that meets the cleaning requirements of Section B1-1c(1). The leak proof and inert nature of the integrated holding area interior surface must be demonstrated and documented. Samples are not transported to another location when using on-line integrated sampling/analysis systems; therefore, the sample custody requirements of Section B1-4 and B1-5 do not apply.** The same sampling manifold and sampling heads are used with on-line integrated sampling/analysis systems and all of the requirements associated with sampling manifolds and sampling heads must be met. However, when using an on-line integrated sampling/analysis system, the sampling batch and analytical batch quality control (QC) samples are combined as on-line batch QC samples as outlined in Section B1-1b.

c. B1-1b Quality Control

For manifold and direct canister sampling systems, field QC samples shall be collected on a per sampling batch basis. A sampling batch is a suite of samples collected consecutively using the same sampling equipment within a specific time period. A sampling batch can be up to 20 samples (excluding QC samples), all of which shall be collected within 14 days of the first sample in the batch. For on-line integrated sampling/analysis systems, QC samples shall be collected and analyzed on a per on-line batch basis. Holding temperatures and container requirements for gas sample containers are provided in Table B1-1. An on-line batch is the number of headspace-gas samples collected ~~and analyzed~~ within a 12-hour period using the same on-line integrated analysis system. **The analytical batch requirements are specified by the**

analytical method being used in the on-line system. Table B1-2 provides a summary of field QC sample collection requirements. Table B1-3 provides a summary of QC sample acceptance criteria.

d. Table B1-2

**TABLE B1-2
SUMMARY OF DRUM FIELD QC HEADSPACE SAMPLE FREQUENCIES**

QC Samples	Manifold	Direct Canister	On-Line Systems
Field blanks ^a	1 per sampling batch ^d	1 per sampling batch ^d	1 per on-line batch ^f
Equipment blanks ^b	1 per sampling batch ^d	once ^e	1 per on-line batch ^f
Field reference standards ^c	1 per sampling batch ^d	once ^e	1 per on-line batch ^f
Field duplicates	1 per sampling batch ^d	1 per sampling batch ^d	1 per on-line batch ^f

^a Analysis of field blanks for VOCs (Table B3-2 of Appendix B3), only, is required. For on-line integrated sampling/analysis systems, if field blank results meet the acceptance criterion, a separate on-line blank is not required.

^b One equipment blank or on-line sample shall be collected, analyzed for VOCs (Table B3-2), and demonstrated clean prior to first use of the headspace gas sampling equipment with each of the sampling heads, then at the specified frequency, for VOCs only thereafter. Daily, prior to work, the sampling manifold, if in use, shall be verified clean using an OVA.

^c One field reference standard or on-line control sample shall be collected, analyzed, and demonstrated to meet the QAOs specified in Permit Attachment B3 prior to first use, then at the specified frequency thereafter.

^d A sampling batch is a suite of samples collected consecutively using the same sampling equipment within a specific time period. A sampling batch can be up to 20 samples (excluding field QC samples), all of which shall be collected within 14 days of the first sample in the batch.

^e One equipment blank and field reference standard shall be collected after equipment purchase, cleaning, and assembly.

^f An on-line batch is the number of samples collected and analyzed within a 12-hour period using the same on-line integrated sampling/analysis system. The analytical batch requirements are specified by the analytical method being used in the on-line system.

e. Table B3-3

**TABLE B3-3
SUMMARY OF LABORATORY QUALITY CONTROL SAMPLES AND FREQUENCIES FOR
GAS VOLATILE ORGANIC COMPOUND ANALYSIS**

QC Sample	Minimum Frequency	Acceptance Criteria	Corrective Action ^a
Method performance samples	Seven (7) samples initially and four (4) semiannually	Meet method QAOs	Repeat until acceptable

QC Sample	Minimum Frequency	Acceptance Criteria	Corrective Action ^a
Laboratory duplicates or on-line duplicates	One (1) per analytical batch for GC/MS and GC/FID. One (1) per analytical batch or on-line batch for FTIRS	RPD # 25 ^b	Nonconformance if RPD >25
Laboratory blanks or on-line blanks	Daily prior to sample analysis for GC/MS and GC/FID. Otherwise daily prior to sample analysis and one (1) per analytical batch or on-line batch for FTIRS.	Analyte amounts # 3 x MDLs for GC/MS and GC/FID; # PRQL for FTIRS	Flag Data if analyte amounts > 3 x MDLs for GC/MS and GC/FID; > PRQL for FTIRS
Laboratory control samples or on-line control samples	One (1) per analytical batch for GC/MS and GC/FID. One (1) per analytical batch or on-line batch for FTIRS	70-130 %R	Nonconformance if %R <70 or >130
GC/MS comparison sample (for FTIRS only)	One (1) per analytical or on-line batch	RPD # 25 ^b	Nonconformance if RPD > 25
Blind audit samples	Samples and frequency controlled by the Gas PDP Plan	Specified in the Gas PDP Plan	Specified in the Gas PDP Plan

^a Corrective action per Section B3-13 when final reported QC samples do not meet the acceptance criteria.

^b Applies only to concentrations greater than the PRQLs listed in Table B3-2.

MDL = Method Detection Limit
 QAO = Quality Assurance Objective
 PDP = Performance Demonstration Program
 PRQL = Program Required Quantitation Limit
 %R = Percent Recovery
 RPD = Relative Percent Difference

f. Table B6-1

Are procedures in place to ensure that waste is characterized in groups or batches, if necessary? (sampling batches of up to 20 samples collected within 14 days of the first sample, analytical batches of up to 20 samples received within 14 days of first sample receipt, and on-line batches for integrated headspace gas analysis of all samples collected within 12 hours and analyzed in accordance with the method requirement) (Section B-3)	
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